

REMARKS

The Office Action dated July 25, 2003 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. The specification and Figs. 8 and 9 have been amended. Applicants submit that the amendments made herein are fully supported in the specification and the drawings as originally filed. No new matter has been added or amendments made that narrow the scope of any elements of any claims. Accordingly, claims 1-4 are pending in this application and are submitted for consideration.

The Abstract was objected to because it exceeded the maximum of 150 words. Applicant respectfully presents the attached Abstract. It is submitted that the replacement for the Abstract does not exceed 150 words, and therefore is now in accordance with 37 C.F.R. § 1.72(b). Applicants request that the objection be withdrawn.

The disclosure of the present application was objected to as containing some minor informalities. Applicants submit that the disclosure has been amended to overcome the minor informalities therein, and therefore respectfully submits that the present application is in full compliance with U.S. patent practice. The disclosure has also been amended to provide consistency with the changes to Fig. 9. However, with respect to the request to change "plan" on page 4, line 11 to "plain," the Applicants respectfully submit that 37 C.F.R. § 1.84(h) states, in part, that "[t]he views may be plan, elevation, section or perspective views." Therefore, the change has not been made.

Applicants request that the objection be withdrawn.

The drawings were objected to because reference numbers 21b and 22b are mislabeled in Fig. 8. Fig. 8 has been amended by re-labeling reference numbers 21b and 22b. The drawings were also objected to as failing to comply with 37 CFR 1.84(p)(4) because reference numbers 21 and 22 have been used to designate both the first two steps of Fig. 9 and the sensors of Figs. 7 and 8. Fig. 9 has been amended by renumbering the "steps" from "21-25" to "23-27". Therefore, Applicants respectfully request that the objection be withdrawn.

Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaks (U.S. Patent No. 5,615,760). In making this rejection the Office Action took the position that Vaks discloses all the elements of the claimed invention, except for explicitly explaining that the currency is of a paper type.

Applicants' independent claim 1 recites a method of judging the truth of a paper type, including measuring, with respect to each of true paper types previously prepared, a plurality of types of characteristic amounts by a plurality of types of sensors for each of a plurality of portions for examination previously determined, analyzing principal components on the basis of obtained results of the measurement to find an equation of a straight line corresponding to the predetermined principal component, and producing reference data composed of a value relating to the predetermined principal component for the portion for examination on the basis of the found equation of straight line. The method further includes measuring, with respect to the paper type to be examined, the plurality of types of characteristic amounts by the plurality of types of sensors for each of the plurality of portions for examination previously determined, and producing data for examination composed of a value relating to the predetermined principal component for

the position for examination on the basis of obtained results of the measurement and said equation of straight line. The method also includes comparing the reference data and the data for examination to judge the truth of the paper type to be examined.

Vaks discloses a method and apparatus for validating money. As shown in Fig. 2, coin testing apparatus 2 includes coin sensors 4. Each of these sensors measures a different property of a coin inserted in the apparatus. LSI 8 receives the sensor signals and processes the measured values with data values stored in predetermined locations in a PROM 10. The sensors measure conductivity, thickness and diameter of inserted coins. Each sensor comprises one or more coils in a self-oscillating circuit. In measuring the thickness, a change in the inductance of each coil caused by the proximity of an inserted coin causes the frequency of the oscillator to alter, enabling a digital representation of the respective property of the coin to be derived. In measuring conductivity, a change in the Q of the coil caused by the proximity of an inserted coin causes the voltage across the coil to alter.

Each of six acceptance regions, as shown in Fig. 4, are substantially ellipsoidal in shape. For example, items falling within the region R_A are statistically likely to be acceptable coins and items falling outside the acceptance region are statistically unlikely to be genuine. As shown in Fig. 3, the PROM 10 stores for each of coin denominations A to F, a value representing the statistical mean of the measurements of property P_1 of a population of coins of denomination A, and a value representing the standard deviation for those property measurements, and corresponding values for the other properties P_2 and P_3 . In order to validate an inserted item, the LSI 8 takes measurements P_1 to P_3 of the inserted item. The LSI 8 then addresses the PROM 10

so as to read out the stored values relating to coin A, in order for the LSI 8 to be able to perform the calculations as shown in the equation (1) in col. 5. Once the evaluation has been carried out in respect to coin A, the same process is carried out with respect to coins B through F.

The Office Action took the position that Vaks discloses analyzing principal components on the basis of obtained results of the measurement defining equation of a straight line corresponding to the predetermined principal component, as recited in claim 1 of the method of the present invention, in Fig. 5 of Vaks. The Office Action also took the position that Vaks discloses producing reference data composed of a value relating to the predetermined principal component for the portion for examination on the basis of the found equation of a straight line, as further recited in claim 1. However, upon review of the prior art, VAKS does not disclose or suggest analyzing principal components on the basis of obtained results of the measurement, to find an equation of straight line corresponding to the predetermined principal component, as recited in claim 1 of the present application.

Fig. 4 of VAKS shows the acceptance region RA having three axes, which represent three measured properties (P1, P2 and P3). The region RA shown in Fig. 4 is elliptic in shape. In Fig. 5, the three axes are transformed into $P1/s1$, $D1$, $P2/s2$, $D2$ and $P3/s3$, $D3$, respectively and due to this transformation, the region RA is spherical in shape. However, the invention of VAKS does not address analyzing principal components based on the results of the measurement, or finding an equation of straight line corresponding to the predetermined principal component, as recited in claim 1 of the present application.

The Office Action further asserted that Fig. 5 of Vaks discloses, "measuring, with respect to the paper type to be examined, the plurality of types of characteristics amounts by the plurality of types of sensors for each of the plurality of portions for examination previously determined, and producing data for examination composed of a value relating to the predetermined principal component for the position for examination on the basis of obtained results of measurement and the straight line," as also recited in claim 1. However, upon review of Fig. 5 of Vaks, Applicants are unable to find any such disclosure.

In Vaks, the mere use of plural sensors allows the production of counterfeit bills, because once the types of these sensors are identified, counterfeit bills can be produced that give these sensors valid data corresponding to genuine paper money. Consequently, the bills will be judged to be authentic. However, the present invention solves this problem, for example, by measuring a plurality of types of characteristic amounts by the plurality of sensors for each of a plurality of portions for examination previously determined, as also recited in claim 1.

Furthermore, although the Office Action took the position that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the invention of Vaks, to validate bank notes, the Applicants also respectfully disagree with this assertion. Claim 8 of Vaks broadly recites that for bank note validation, n different measurements of a bank note are taken to define a point in n -dimensional space defined by axes representing the n respective measurements, and a control circuit operates to validate the bank note if the point lies within an n -dimensional ellipse, the axes of which are parallel to a respective property measurement axis associated with

the particular bank note denomination. This is clearly different than the method of the claimed invention.

Therefore, it is respectfully submitted that the Applicants' invention, as set forth in claim 1 is not obvious within the meaning of 35 U.S.C. § 103.

Claims 2-4 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Vaks in view of Ishida et al. (U.S. Patent No. 5,419,423, "Ishida"). In making this rejection, the Office Action took the position that Vaks discloses all the elements of the claimed invention, except for using a magnetic sensor and a light sensor as the plurality of sensors and using a red-light sensor and an infrared light sensor as the plurality of sensors. Ishida is cited for disclosing these limitations.

Ishida discloses a paper money processor including a data reader section 5 that has an optical sensor 30 for detecting light passing through the paper money and a magnetic sensor 31 for detecting the magnetism of the paper money. On the basis of the output signals of light and magnetic sensors 30 and 31, it is determined whether the inserted paper money is false or genuine. Optical sensor 30 includes light emitting and receiving elements 30a and 30b. Magnetic sensor 31 includes magnetic head 31a and pressure roller 31b. Optical sensor 30 includes optical sensor PxL, PxC and PxR. Magnetic sensor 31 includes magnetic sensors LHD and RHD. Optical sensors PxL and PxR detect the light passed through the paper money with use of infrared ray. Optical sensor PxC detects the light passed through the paper money with the use of red light.

However, as discussed above, Vaks fails to disclose or suggest the claimed invention. Ishida fails to cure the deficiencies of Vaks. Therefore, Applicants submit

that neither Vaks nor Ishida, either alone or in combination, discloses or suggests the claimed invention.

Therefore, it is respectfully submitted that the Applicants' invention, as set forth in claims 2-4 is not obvious within the meaning of 35 U.S.C. § 103.

Information Disclosure Statement

With respect to the Information Disclosure Statement submitted on October 10, 2000, Applicants submit herewith an English language translation of Nakata for the Examiner's review and consideration.

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding rejections, allowance of claims 1-4, and the prompt issuance of a Notice of Allowability are respectfully solicited.

If this application is not in condition for allowance, the Examiner is requested to contact the undersigned at the telephone listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper,

may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 107314-00012.**

Respectfully submitted,
ARENT FOX KINTNER PLOTKIN & KAHN PLLC



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Enclosures: Substitute Abstract of the Disclosure
Petition for Extension of Time
Figures 8 and 9
Information Disclosure Statement
English Translation of Nakata
Check in the amount of \$420.00

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